**Total Shoulder Arthroplasty**

 This protocol is based The American Society of Shoulder and Elbow Therapists’ consensus statement on rehabilitation for anatomy total shoulder arthroplasty (1). This program is an evidence-based and soft tissue healing dependent program allowing patients to progress to vocational and sports-related activities as quickly and safely as possible. Individual variations will occur depending on surgical technique and the patient’s response to treatment. **See surgeon’s operative note for specific range of motion restrictions especially EXTERNAL ROTATION**. Please contact us at 1-800-362-9567 ext. 58600 if you have questions or concerns.

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| **Phase I: 0-6 weeks** | **Immediate Post Operative Maximum Protection Phase** |
| **Goals** | * Protect the subscapularis tendon repair
* Decrease joint effusion and soft tissue edema
* Decrease pain
 |
| **Restrictions** | * No lifting, pushing, and pulling
 |
| **Sling**  | * Continue with wearing Sling Shot brace until directed otherwise by surgeon.
 |
| **PROM/ AAROM/AROM** | * Review operative note for “safe zone” of external rotation
* No active range of motion
* AAROM/PROM flexion and abduction to tolerance
 |
| **Strengthening** | * Rehabilitation specialists should select exercises that demonstrate less than 15% maximum voluntary isometric contraction (MVIC) on electromyography for the subscapularis as these guidelines have been proposed as a safe level of activation following rotator cuff repair
* See “Treatment Interventions” section below for exercises that fall below 15%.

**Considerations**: Per the consensus statement supine exercises soon after the anatomic total shoulder arthroplasty are challenging due to:* If the arm is not well supported in the plane of the scapulae, there may be painful strain across the healing incision, anterior joint capsule, and subscapularis tendon
* Many patients are challenged with getting in and out of supine position without weightbearing on the surgical arm
* Finding a place to sit to do range of motion is likely more convenient than lying, which may assist with home exercises compliance
 |
| **Treatment Interventions** | **The exercises listed below are <15% MVIC for subscapularis (2):** * Pulley-assisted elevation: 8%
* Table Slide: 10%
* Prone Shoulder Flexion: 12%
* Seated Row: 14%
* Wall-Assisted External Rotation: 15%
* **Supine-assisted elevated was found to be higher than the recommended level: 24%**

**See Table 1 listed below for % MVIC ranking of each exercise for the subscapularis**  |
| **Modalities** | * As needed for pain control
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| **Phase II: 6-12 weeks** | **Range of Motion Phase** |
| **Goals** | * Gradually restore range of motion
* Expected range of motion varies based on preoperative diagnosis of Anatomy Total Shoulder Arthroplasty
* Anatomy Total Shoulder Arthroplasty have been shown to achieve 140-150 degrees of scapular elevation, 50-60 degrees of external rotation at the side, and internal rotation to the upper lumbar spine (3)
 |
| **Restrictions** | * See Operative Note for specific external rotation range of motion limits
* No lifting greater than 1 lb (“a cup of coffee”)
* Avoid excess overpressure to protect healing joint
* Closed kinetic chain in both weight-bearing and non-weightbearing positions are not indicated
 |
| **Range of Motion** | * AROM/AAROM/PROM: no restrictions except ER based on operative note
 |
| **Strengthening** | * **Active range of motion exercises with no lifting >1 lb**
 |
| **Treatment Interventions** | **Active Assisted Range of Motion*** Wall walks
* Pulleys: elevation/flexion
* Seated AAROM with dowel

**Active Range of Motion** * Sidelying external rotation
* Supine shoulder flexion
* Sidelying shoulder abduction
* Prone I, Prone Y, and Prone T
* Prone horizonal abduction with external rotation
* Scapular retraction
* Supine serratus punch
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| **Phase III: 12+ Weeks** | **Strength Phase** |
| **Goals** | * Restore end range mobility of the shoulder in all planes
* Increase rotator cuff strength to 5/5
* A gradual return to prior level such as golf, tennis, and swimming is allowed, with full return to play restricted until post operative month 6 to allow for subscapular tendon healing
 |
| **Restrictions** | * No weight restrictions
* Heavy impact loading such as bench press, wood chopping, and use of a sledgehammer is not advised (1)
 |
| **Range of Motion** | * As tolerated
 |
| **Strengthening** | * Strengthening exercises may progress gradually using light hand weight or elastic band resistance
* Closed kinetic chain exercises are now permitted including planks, yoga poses, and quadruped exercises
 |
| **Treatment Interventions** | * Closed kinetic chain exercises including planks, quadruped shoulder stabilization exercises, ball on wall, lateral reaches on wall, etc.
* Continue with phase 2 exercises as needed
* Scaption
* Overhead press
* PNF D1/D2 stabilization
* Bicep strengthening
* 90/90 external rotation strengthening
* Body blade exercises
 |

Table 1. Subscapularis pooled means (range) of percent MVIC ranking of exercise. Copied from Reference (2)

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| **Exercise**  | **% Maximum Voluntary Isometric Contraction** |
| **Pulley Assisted Elevation**  | 8% |
| **Table Slide** | 10% |
| **Prone Shoulder Flexion** | 12% |
| **Seated Row** | 14% |
| **Wall-Assisted External Rotation** | 15% |
| **Upright Bar-Assisted Elevation** | 24% |
| **Upright Bar-Assisted External Rotation** | 27% |
| **Forward Punch** | 35% |
| **Internal Rotation: 0° of Abduction** | 40% |
| **Internal Rotation: 45° of Abduction** | 53% |
| **External Rotation: 0° of Abduction** | 57% |
| **External Rotation: 90° of Abduction**  | 57% |
| **Dynamic Hug** | 58% |
| **Diagonal**  | 60% |
| **Internal Rotation: 90° of Abduction** | 65% |
| **Low Row** | 69% |
| **High Row** | 74% |
| **Standing Row** | 81% |
| **Resisted Shoulder Extension** | 97% |
| **Resisted Active Elevation/Flexion** | 99% |

**\*\*\***If you have any questions regarding how to perform the exercise see Reference 2.

**References**

1. Kennedy, J. S., Garrigues, G. E., Pozzi, F., Zens, M. J., Gaunt, B., Phillips, B., ... & Tate, A. R. (2020). The American Society of Shoulder and Elbow Therapists' consensus statement on rehabilitation for anatomic total shoulder arthroplasty. *Journal of shoulder and elbow surgery*, *29*(10), 2149-2162.
2. Edwards, P. K., Ebert, J. R., Littlewood, C., Ackland, T., & Wang, A. (2017). A systematic review of electromyography studies in normal shoulders to inform postoperative rehabilitation following rotator cuff repair. *journal of orthopaedic & sports physical therapy*, *47*(12), 931-944.
3. Kiet, T. K., Feeley, B. T., Naimark, M., Gajiu, T., Hall, S. L., Chung, T. T., & Ma, C. B. (2015). Outcomes after shoulder replacement: comparison between reverse and anatomic total shoulder arthroplasty. *Journal of Shoulder and Elbow Surgery*, *24*(2), 179-185.